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**Notice of Allowability**

Application No.

10/763,549

Examiner

Krishnan S. Menon

Applicant(s)

CHO ET AL.

Art Unit

1723

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to filing on 1/23/04.
2. ☒ The allowed claim(s) is/are 1-3,5-9 and 11; RENUMBERED 1-9.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
  1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08);  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

### **EXAMINER'S AMENDMENT**

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Michael Crabb on 4/20/06.

The application has been amended as follows:

#### **Amendments to the Specification:**

The following new heading and paragraph was inserted in the beginning on page 1, line 2 prior to "Field of the Invention":

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#### **Cross-reference to Related Applications**

This application is a divisional of United States Serial No. 10/074,962 filed February 13, 2002, now abandoned.

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#### **AMENDMENT TO THE CLAIMS**

Claims were amended to make the application in condition for allowance. An Amended claims list follows on a fresh page below.

***Amended Claims List***

1. (Currently amended) A method for making an anti-microbial filter for a micro-fluidic system, the method comprising the steps of:

providing a substrate;

forming a filter membrane of a filter material on the substrate; and

forming a plurality of holes through the filter membrane by

providing a filter mask having a plurality of holes therein over the filter membrane by depositing a plurality of spacers on the filter material such that a part of each of the spacers contacts the filter material to define said plurality of ~~recesses~~ and holes in the filter mask, depositing filter mask material partially around the spacers and on the filter material such that the part of each of the spacers that contacts the surface of the filter material prevents the filter mask material from continuously coming between the spacers and the filter material and thereby defines one of the plurality of holes in the filter mask, removing the plurality of spacers to form the plurality of ~~recesses and~~ holes in the filter mask, and

forming the plurality of holes in the filter membrane in registration with the plurality of ~~recesses and~~ holes in the filter mask respectively; and

removing at least a portion of the substrate to expose at least some of the holes in the filter membrane;

wherein, said spacers are sub-micron particles selected from polystyrene, silica or carboxylate polystyrene.

2. (Original) The method according to claim 1, wherein the step of forming the filter membrane further comprises the step of:

diffusing filter material into a predetermined depth of the substrate, wherein the predetermined depth of the diffusion of the filter material into the substrate corresponds to a predetermined thickness of the filter membrane.

3. (Original) The method according to claim 1, wherein the step of forming the filter membrane further comprises the step of:

depositing the filter membrane on the substrate.

4. (Canceled)

5. (Original) The method according to claim 1, wherein the step of removing the plurality of spacers further comprises the step of:

dissolving the plurality of spacers.

6. (Original) The method according to claim 1, wherein the step of removing the plurality of spacers further comprises the step of:

disintegrating the plurality of spacers.

7. (Currently amended) The method according to claim 1, wherein the step of forming the plurality of holes in the filter membrane comprises the step of:

etching the filter membrane through the ~~recesses~~ holes in the filter mask.

8. (Original) The method according to claim 1 comprising the step of:

depositing an anti-microbial coating between the holes on the filter membrane.

9. (Currently amended) The method according to ~~claim 9~~ claim 8 wherein the anti-microbial coating contains silver.

10. (Canceled)

11. (Currently amended) The method according to ~~claim 10~~ claim 7, wherein the etching step includes reactive ion etching.

12 – 15 (Canceled)

***Allowable Subject Matter***

Claims 1-3, 5-9 and 11 are allowed.

The following is an examiner's statement of reasons for allowance: Claim 1 recites a process for making an anti-microbial filter, which include the process steps of forming holes in a mask over the filter membrane by depositing a layer of spacers, which are sub-micron particles of polystyrene, etc., on the membrane, depositing the mask on the membrane around the spacers and then removing the spacers, forming the holes in the membrane through the holes in the mask, and then removing the mask. This feature is not taught in any references. The closest references are Tai et al (US 6,622,872), and Frantzen (US 3,423,261). Tai teaches the method of making a filter using reactive ion etching, which the applicant discloses as well known in the art. The novelty in this process, i.e., the use of "spacers" to form the holes in the mask is taught by Frantzen, which teaches forming the "spacers" (14) in figure 3, depositing the "mask" (15) around the spacers and over the membrane (13) in figure 4, removing the spacers in figure 6, and forming the holes in the membrane in figure 7. However, Frantzen or Tai does not teach the particulate material as spacers to form the lead holes in the mask.

Sawan et al (US 5,681,468) teaches a filter antimicrobial coating such as metallic silver on the surface.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'K. S. Menon', with a stylized, cursive script.

Krishnan S. Menon  
Patent Examiner  
4/20/06